# Australian Bureau of Statistics

## 6202.0 - Labour Force, Australia, Feb 2017  ℹ️Quality Declaration

ARCHIVED ISSUE Released at 11:30 AM (CANBERRA TIME) 16/03/2017

## CHANGES TO FILTER LENGTHS USED IN LABOUR STATISTICS

### INTRODUCTION

As part of ongoing continuous improvement, the ABS has completed a review, highlighted in the January 2017 issue, into the length of seasonal filters used in the Labour Force series. This review determined that changes to the lengths of seasonal filters for specific seasonally adjusted series will provide more stable seasonal factors and reduce the average size of revisions through the concurrent seasonal adjustment and trend estimation process.

The ABS will change seasonal adjustment filter lengths as part of its annual seasonal re-analysis, which will result in one-off minor revisions throughout the time series in the March 2017 estimates (which will be published on 13 April 2017).

### WHAT ARE SEASONAL ADJUSTMENT FILTERS AND WHY ARE THEIR LENGTHS IMPORTANT?

Seasonal filters are used as part of the seasonal adjustment process to measure and account for seasonal patterns in data. Filters set the parameters under which seasonal patterns are identified and measured. Once measured, these seasonal patterns are described as "seasonal factors". The choice of seasonal adjustment filter is important, to ensure they most effectively identify the seasonal patterns arising in the data.

There are two important questions that need to be considered for each series:

I. What are the identifiable seasonal patterns?

II. How far into the past and into the future should we look to best estimate the seasonal patterns?

The answer to the first question is relatively straight forward. All Labour Force series show some seasonal patterns throughout the year, though this varies from series to series. The most obvious is around the Christmas period, from November through to February. There are also a range of effects related to seasonal climate and weather patterns, other cultural events and annual milestones, such as leaving school. These seasonal influences are generally visible in the 'Original' estimates and in the following chart, for example:

**15-24 Years Old Employment, Persons,** February 2012 to February 2017
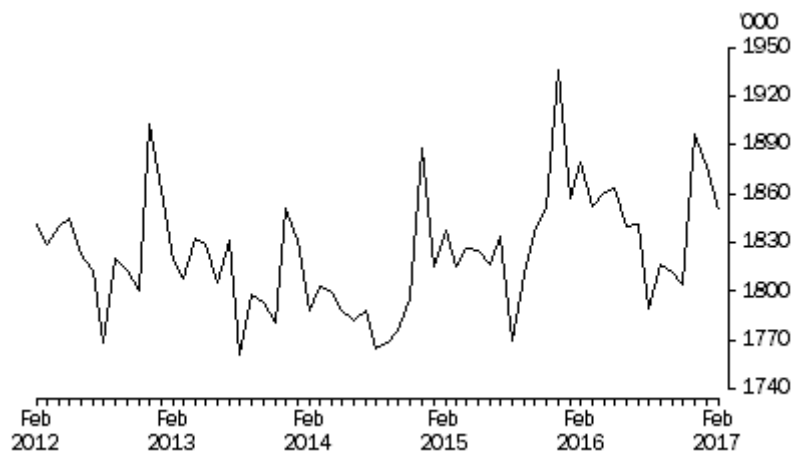
The answer to the second question stems from the first. Having identified the regular patterns, over what time period should the seasonal factors be estimated?

Where a series has a high degree of irregularity and the underlying seasonal pattern is less pronounced, a longer seasonal filter is recommended. This is because longer filters will calculate a weighted average over a longer period of time, making them less susceptible to influence by one-off irregularities. Conversely, when a seasonal pattern is very strong and stable, a shorter filter is more acceptable, as it is possible to see and explain the effect over a shorter period.

Once a filter length is set, it determines how quickly seasonal factors change reflecting changes in seasonal patterns. Shorter filters will more readily react to recent information, at the risk of including random variability and noise. Longer filters observe patterns over a longer time and will adjust more slowly to systemic changes resulting in changing seasonal patterns.

## WHY IS THE ABS CHANGING THEM?

According to international best practice, filter lengths are chosen to provide the highest quality seasonal adjustment for that series - mainly focused on reducing the average size of revisions. Until now, the ABS has generally used filters considered mid-length, set as the default across Labour Force time series since the beginning of the monthly series in 1978. This reflects a design principle dating back to the introduction of seasonal adjustment, which was focused on consistency between different series, rather than optimising the approach for each series.

However, recent research has shown that there are no significant benefits from consistent filter lengths across series, and that it is less important than the objective of reducing revisions within seasonally adjusted estimates. The ABS has explored using longer filter lengths on some of its more volatile original series, and confirmed that, for some series, adopting a longer seasonal filter would reduce the average size of revisions.

A list of series for which their filter length has been changed will be included in the March issue, on 13 April 2017. This list will also reference the quarterly series, which will have filter length changes applied with the release of May 2017 data.

## WHAT ARE THE SIZE OF REVISIONS?

Changing the filter length of a series will only result in small revisions throughout the entire time series. Small revisions occur each month, as part of the concurrent adjustment process, with the changes to filter lengths resulting in slightly larger (though still small) revisions than are usually
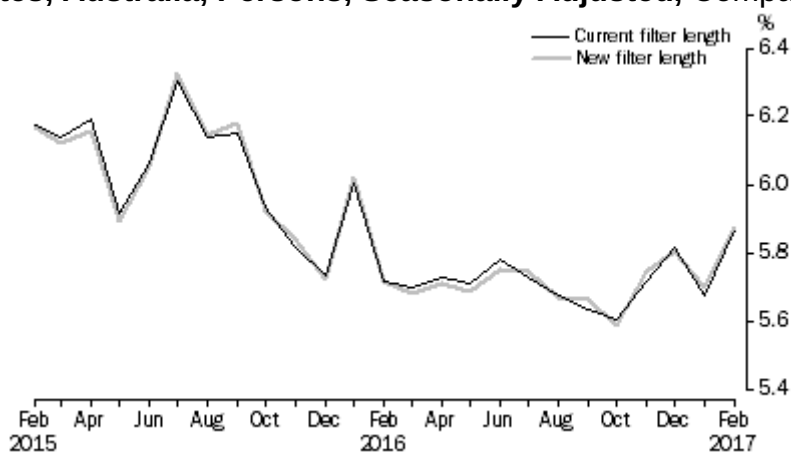
observed, as a one-off.

The below graphs provide an illustration of the effect of revisions.

**Employed, Australia, Persons, Seasonally Adjusted,** Comparison of filter lengths
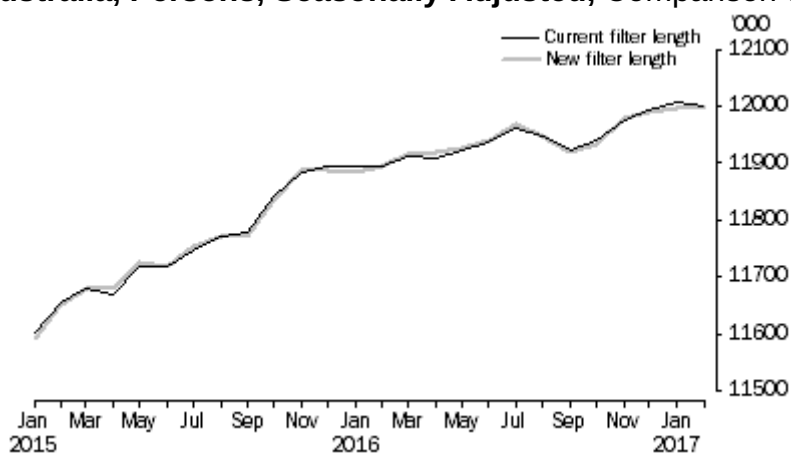


**Unemployment Rates, Australia, Persons, Seasonally Adjusted,** Comparison of filter lengths



**FOR MORE INFORMATION**

For more information on time series analysis and seasonal adjustment, please see the following references:

Time Series Analysis Frequently Asked Questions, 2003 (cat. no. 1346.0.55.002)

Time Series Analysis: The Process of Seasonal Adjustment

Research Paper: Automated ARIMA Model Selection for Aiding Filter-Based Seasonal Adjustment (Methodology Advisory Committee), Jun 2012 (cat. no. 1352.0.55.124)

This page last updated 19 July 2017